SPECIFICATION

Title

METHOD OF MANAGING USE HISTORY OF A RENTAL ELECTRIC HOME APPLIANCE THROUGH A COMMUNICATION NETWORK

Brief Description Of The Drawings

Fig. 1 shows a whole system in which an embodiment of the present method can be embedded;

Fig. 2 is a flowchart of an embodiment of a method of managing use history of rental electric home appliances through a communication network; and

Fig. 3 is a flowchart of another embodiment of a method of managing use history of rental electric home appliances through a communication network.

Major Elements In Drawings

10a~10n: terminal
20: Internet
30: Washing management server
40: washing machine
50: interfacing means

Background Of The Invention

The present invention relates to a method of managing use history of rental electric home appliances through a communication network, more particularly, to a method of receiving use particulars of rent electric home appliances such as a washing machine, a dish washer, and so on through a communication network and charging for the use particulars.

A washing machine, one of electric home appliances, has been very popularized owing to its superior washing ability and its convenience for use, and it has various washing course programs in its memory each of which chooses automatically washing time, rinsing time, spinning time, etc. appropriate to an amount of clothes and cloth material for the purpose of preventing damage of clothes as well as washing more cleanly.

The washing course programs are usually prepared for spinning wash, high-concentrated wash, a first laundering, pulsating wash, clothes-soaking wash, wool-fabric wash, etc. Thus, a user can wash clothes automatically with ease by only selecting one washing course program he or she wants.

In these days, a multi-family house, an apartment, a dormitory of company or school has a washing machine and a dish washer as a fixture, therefore, when moving to other place, a resident should work for water pipe deconstruction and reinstallation. However, such works are very difficult. In addition, when a person living in a dormitory, a home-combined office, or a studio apartment is about to marry, a new washing machine of larger load capacity is necessary, however, an old one of small load capacity is difficult to dispose.

There is another problem that washing is not easy while a person is traveling or is in on a business trip.

Explanation Of The Invention

It is an object of the present invention to provide a method of managing use history of rental electric home appliances through a communication network which enables a person to wash clothes with

a rental washing machine installed at individual house or anywhere.

It is another object of the present invention to provide a method of managing use history of rental electric home appliances through a communication network which can charge each subscriber for use particulars of electric home appliances rent to the subscriber.

A method of managing use history of a rental electric home appliance through a communication network according to an embodiment of the present invention comprises the steps of: receiving information on use particulars of the rental electric home appliance through the communication network; calculating charge for use of the rental electric home appliance based on the received information on use particulars; and transmitting the calculated charge to a user's terminal through the communication network.

Another method of managing use history of a rental electric home appliance through a communication network according to another embodiment of the present invention comprises of the steps of: authenticating a subscriber number received through the communication network; transmitting a start signal for the rental electric home appliance identified by the subscriber number through the communication network to a corresponding subscriber's terminal if the subscriber number is authenticated successfully; receiving use information of the rental electric home appliance through the communication network, calculates charge for use of the rental electric home appliance based on the received use information; and transmitting the calculated charge to the user's terminal through the communication network.

Another method of managing use history of a rental washing

machine through a communication network according to another embodiment of the present invention comprises of the steps of: receiving, through the communication network, information on washing conditions of an optimal washing course program set based on clothes inserted in the rental washing machine, and calculating charge for use of the rental electric home appliance based on the received information on washing conditions; transmitting the calculated charge to a user's terminal through the communication network; and transmitting a start signal to the rental washing machine through the communication network if a washing request is received.

Another method of managing use history of a rental washing machine through a communication network according to another embodiment of the present invention comprises of the steps of: authenticating a subscriber number received through the communication network; receiving, through the communication network, information on washing conditions of an optimal washing course program set based on clothes inserted in the rental washing machine and calculating charge for use of the rental electric home appliance if the subscriber number is authenticated successfully; transmitting the calculated charge to the user's terminal through the communication network, and transmitting a start signal to the rental washing machine through the communication network if a washing request is received.

In order that the invention may be fully understood, a preferred embodiment thereof will now be described with reference to the accompanying drawings.

Fig. 1 shows a whole system in which an embodiment of the present

method is embedded. The system of Fig. 1 includes Internet 20; a washing management server 30 running a washing related web site; terminals 10a to 10n capable of connecting to the washing related web site; and a washing machine 40 being able to communicate with each of the terminals 10a to 10n through an interfacing means 50.

The terminals 10a to 10n are equipping with a data input means such as a keyboard, an electronic pen, a mouse, or a voice recognition software; a displaying means such as a video monitor, an LCD; an outputting means such as a speaker; a processing means such as a CPU; and an embedded web browser.

The terminals 10a to 10n are depicted as a notebook or personal computer in Fig. 1, however they can be mobile stations capable of connecting to the washing management server 30 through Internet 20 with an embedded WAP protocol. If a mobile station is used, it has superior advantage of remote control of a washing machine to a notebook or a personal computer, however, a mobile communication network should be used additionally.

The washing management server 30 stores registered information of each subscriber (or consumer) where each registered information consists of subscriber number, unique number of a washing machine rent to a subscriber, type (drum, agitator, pulsator, twin tub, drier-combined, etc.) of a rent washing machine, load capacity (5kg, 6kg,..,13kg, etc.) of a washing machine, motor type (BLDC, induced, SRM, etc.) of a washing machine.

And, the washing management server 30 receives washing condition information entered and selected by a subscriber through a front panel of the washing machine 40. The washing condition information includes

load (weakest, weak, medium-weak, medium, medium-heavy, heavy, heaviest) of clothes to wash, a course program (spinning wash, high-concentrated wash, a first laundering, pulsating wash, clothes-soaking wash), washing time (10 minutes ~ 2 hours), the number of washing repetition, the number of spinning, spinning time, the number of rinsing repetition, etc. This information is delivered to the washing management server 30 through one of the terminals 10a to 10n and Internet 20. The washing management server 30 calculates the charge for washing based on the received washing condition information and the registered information. When washing of clothes is done at the washing machine 30, the washing management server 30 adds the calculated charge to total sum which will be sent to the user's terminal through Internet 20.

Instead of subscriber's entering and selection of the washing condition information, the washing machine 40 can choose the washing conditions adequate to an amount of clothes to wash after checking the load of clothes if a subscriber wants automatic washing operation, and then transmit information of the chosen washing conditions to the washing management server 30 through one of the terminals 10a to 10n and Internet 20. In general, the washing machine 40 can measure its load, namely, an amount of clothes to wash through shaking its tub by a well-known specific device installed in it. Therefore, the washing machine 40 can choose optimal washing course program, washing time, the number of washing repetition, the number of spinning, each spinning time, the number of rinsing repetition, etc. based on the measured load.

The washing machine 40 may be installed at a subscriber's (or

consumer's) house when it is rent on a subscriber's request, or installed in a laundry or a common lodging house by an enterprise running the washing management server 30. If the washing machine 40 is rent to a consumer for private use, the enterprise installs the washing machine 40 in the consumer's house and gives a subscriber number to the consumer. If the washing machine 40 is installed in a laundry etc., the washing management server 30 manages a plurality of subscribers for the washing machine 40 wholly.

In Fig. 1 where it is supposed that the washing machine 40 has been installed in a private house, the washing machine 40 is connected to a single terminal, however, about two terminals may be connected to a plurality of washing machines installed in a laundry. If an amount of data to be communicated with the washing management server 30 is small, a single terminal may be used for the plurality of washing machines. The interfacing means 50 inclusive of a connecting cable may be an RS-232C device or a modem which is generally used for serial communication between a computer and an external apparatus.

I/O ports (not shown in Fig.1) for connecting the interfacing means 50 are equipped at each side of the washing machine 40 and the terminal 10a, respectively. The washing machine 40 and the terminal 10a can communicate data each other through the interfacing means 50 connected to each I/O port.

Fig. 2 is a flowchart of an embodiment of a method of managing use history of rental electric home appliances through a communication network. The flowchart of Fig. 2 explains procedures that a rental washing machine is used and each washing service is charged on the condition that the rental washing machine has been installed by

requesting rent of a washing machine to the washing management server 30. The fact that a washing machine has been installed in a laundry does not make any difference in the procedures of Fig. 2.

A subscriber enters his or her subscriber number through one of the terminals 10a to 10n after being connected to a web site being run by the washing management server 30 through Internet 20 (S10, S12). The entered subscriber number is transmitted to the washing machine 30 through Internet 20, and it authenticates the received subscriber number based on the registered subscriber information (S14).

If the received subscriber number is wrong at the authentication step ('No' at the step S14), the washing management server 30 sends a message requesting re-input of a subscriber number to the user's terminal through Internet 20 (S16).

If the received subscriber number is valid ('Yes' at the step S14), the washing management server 30 sends an 'unlock' signal to a controller (not figured) of the washing machine through Internet 20 and the user's terminal (S18). The 'unlock' signal sent to the controller makes the washing machine be in washable state.

The subscriber selects an amount of clothes, a washing course program, washing time, the number of washing repetition, the number of spinning, spinning time, the number of rinsing, etc. through a front panel on top of the washing machine or the data input means of the user's terminal. When the subscriber chooses an automatic washing operation, the controller of the washing machine selects automatically a washing course program, washing time, the number of washing repetition, the number of spinning, spinning time, the number

of rinsing, etc. which are appropriate to an amount of clothes in a tub after checking the amount of clothes.

After that, if the subscriber presses a 'start' button on the front panel of the washing machine or a specific button, which is pre-defined for 'washing start', of the user's terminal (S20), the controller starts to wash the clothes in its tub. While the clothes are being washed, the controller transmits information related with the selected washing conditions, namely, the amount of clothes in tub, a washing course program, washing time, etc. to the user's terminal through the interfacing means 50, and the user's terminal delivers the received information on washing conditions to the washing management server 30 through Internet 20 (S22).

Then, the washing management server 30 calculates the charge for present washing service based on both of the received washing condition information regarding the amount of clothes, a washing course program, washing time, etc. and the registered information for the subscriber, namely, unique number of the rental washing machine, its type, its load capacity, its motor type.

When the washing of clothes is done ('Yes' at the step S24), the controller of the washing machine 40 transmits a 'washing-done' signal to the washing management server 30 through the user's terminal and Internet 20. Then, the washing management server 30 adds the calculated charge to total fee imposed from use of the rental washing machine until now, and it transmits both the calculated charge and the updated total fee to the user's terminal through Internet 20 (S26). Then, the current charge and the total fee are displayed on the displaying means of the user's terminal. This charge information may

be delivered to the washing machine 40 and then displayed on the front panel thereof.

The washing management server 30 prints out a bill of the total fee including washing particulars and sends it to a credit card company or to the subscriber directly (S28).

Fig. 3 is a flowchart of another embodiment of a method of managing use history of rental electric home appliances through a communication network. The flowchart of Fig. 2 explains procedures that washing charge estimated for current clothes is informed a subscriber (or consumer) before washing and an accomplished washing service is charged so much on the condition that the rental washing machine has been installed by requesting rent of a washing machine to the washing management server 30. The fact that a washing machine has been installed in a laundry does not make any difference in the procedures of Fig. 3.

A subscriber enters his or her subscriber number through one of the terminals 10a to 10n after being connected to a web site being run by the washing management server 30 through Internet 20 (S30, S32). The entered subscriber number is transmitted to the washing machine 30 through Internet 20, and the washing management server 30 authenticates the received subscriber number based on the registered subscriber information (S34).

If it is determined that the received subscriber number is invalid in the authentication procedure ('No' at the step S34), the washing management server 30 sends a message requesting re-input of a subscriber number to the user's terminal through Internet 20 (S36).

If the received subscriber number is determined to be valid

('Yes' at the step S34), the washing management server 30 will receive information on washing conditions set for clothes in tub through Internet 20 (S38) according to the following procedures.

If the received subscriber number is valid, the subscriber selects various washing conditions for clothes in a tub through a front panel of the washing machine or the data input means of the user's terminal. Then, data related with the chosen washing conditions are transferred to the washing management server 30 through Internet 20. When the subscriber chooses an automatic washing operation, the controller of the washing machine decides the washing conditions including a washing course program, washing time, the number of washing repetition, the number of spinning, spinning time, the number of rinsing, etc. which are suitable to an amount of clothes in a tub after checking the amount of clothes. The information on the automatically-determined washing conditions are also transferred to the washing management server 30 through Internet 20 and the user's terminal connected via the interfacing means 50.

Then, the washing management server 30 estimates the charge for washing service to be conducted now based on both of the received washing condition information of the amount of clothes, a washing course program to be executed, washing time, etc. and the registered information for the subscriber, namely, unique number of the rental washing machine, its type, its load capacity, its motor type. The washing management server 30 sends the estimated charge to the user's terminal of the subscriber through Internet 20 (S40).

If the estimated charge for current washing service is displayed on the displaying means of the user's terminal, the subscriber

determines whether to start washing of the clothes based on the estimated charge. If the subscriber wants to wash, he or she presses a 'start' button, if not because the charge is too high, he or she presses a 'cancel' button.

When the subscriber presses the 'start' button on the front panel of the washing machine or a specific button, which is pre-defined for 'washing start', of the user's terminal ('Yes' at the step S42), the controller sends a 'start-requested' signal to the washing management server 30 through Internet 20. Then, the washing management server 30 sends the 'unlock' signal to the controller of the washing machine through Internet 20 and the user's terminal in order to make the washing machine be in washable state (S44).

When the washing of clothes is done after washing is started, the controller of the washing machine transmits a 'washing-done' signal to the washing management server 30 through the user's terminal and Internet 20. The washing management server 30 adds the estimated charge, which is real charge for the just-conducted washing service, to total fee imposed from use of the rental washing machine until now, and it transmits both the real charge and the added total fee to the user's terminal through Internet 20 (S46). Then, the current charge and the total fee are displayed on the displaying means of the user's terminal. This charge information may be delivered to the washing machine and then displayed on the front panel thereof.

The washing management server 30 prints out a bill of the total fee including washing particulars and sends it to a credit card company or to the subscriber directly (S48).

The above-explained embodiments can be modified variously as

follows.

First, the subscriber calls an operator of the washing management server and informs the operator of the unique number of the rental washing machine and his or her subscriber number by a telephone, then a household appliance rental company notified of the request of washing service by the operator drives remotely a washing machine identified by the heard unique number. The unique number and the subscriber number can be delivered to the operator or the washing management server in digital data format through a notebook, a personal computer, or a wired telephone.

Secondly, a pre-paid cash card, e.g., 10-thousand or 20-thousand pre-paid cash card may be sold for use of washing machines installed in places. When a washing machine reads an inserted pre-paid cash card with or without contact, it washes clothes in its tub if the cash remained in the cash card is larger than charge for current washing service. If a pre-paid cash card contains a subscriber number, a subscriber carrying the card can use a washing machine installed anywhere.

Effect Of The Invention

According to the explained method of managing use history of rental electric home appliances through a communication network according to the present invention, washing machines rent or are installed at certain places for subscribers of washing rental service and each subscriber can know from the washing service how much he or she pays for his or her laundry. Therefore, according to the present method, a subscriber need not suffer difficulties of work for water

pipe deconstruction and reinstallation on movement and can use brand-new electric home appliances whenever he or she wants, and rental service provider can satisfy various consumer's (or subscriber's) needs promptly which will result in increase of profits.

The invention may be embodied in other specific forms without departing from the sprit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.